551.506 (265.2)

NORTH PACIFIC OCEAN

By WILLIS EDWIN HURD

Like the preceding month, November was characterized by much cloudy sky, though low percentage of fog, over the northern part of the ocean. Fog was observed, however, over practically the entire area in upper latitudes. Between 45° and 55° N. and 150° and 170° W., it was reported on the 10th to 14th, inclusive. Between 170° W. and the Japanese coast scattered fog occurred on nearly all dates from the 1st to the 10th, but it most frequently appeared in the American coast region between 25° and 50° N. where, taking the belt as a whole, it was recorded on 21 days. The southernmost observation of fog was on the 7th, in 13° 40′ N., 94° 23′ W. Snow, sleet, and hail squalls were reported on a few dates along the northern routes.

At Honolulu northeast winds prevailed. The average velocity there was 8.6 miles an hour, which is somewhat less than the normal. But the maximum velocity was at the rate of 51 miles an hour, on the 21st, which is the highest ever recorded in November, and the third highest ever recorded in any month. This occurred during a northeast to east gale which lasted for more than 48 hours from the 20th to the 22d, while Honolulu was on the southern slope of the North Pacific HIGH at the time of its greatest activity. The highest temperature of the year at Honolulu, 85°, occurred on November 6.

Little weather of a disturbing nature was experienced by vessels plying between San Francisco and Panama, except for gales of forces 8 and 9 which roughened the sea on several dates over and south of the Gulf of Tehuantepec. There were reports of less than the usual amount of rain along this route. In fact, precipitation was less than normal along the entire west coast of the United States as well as at Honolulu. Farther north along the coast precipitation increased and was above normal at Juneau, Alaska.

The few tropical disturbances in the Far East during the month are discussed elsewhere in this issue of the REVIEW by the Rev. José Coronas, S. J., of the Manila Observatory. Our vessel reports, in addition, indicate rough weather between Hongkong and Manila near the middle of the month. High pressure lay over China during most of the period, but several cyclones issued from Manchuria.

The great anticyclone lying normally between Hawaii and northern California was unsteady in prevalence and extent, occasionally dominating most of the eastern part of the ocean, but quite largely being pushed aside or divided by the southward pulsations of the Aleutian cyclone.

Low pressure did not enter the Aleutian area until November 10, although for several days previously cyclonic conditions had prevailed over the eastern part of the Gulf of Alaska, during a part of which time the weather was unusually rough for the season down the Alaskan southeast coast. The maximum wind velocity at Juneau was at the rate of 54 miles an hour from the east, on the 9th. After the 10th the semipermanent LOW settled with considerable intensity over the central Aleutians, whence, after the middle of the month, it fluctuated back and forth over a considerable region. On the 22d a gradient of 1 inch in pressure lay between Dutch Harbor and Kodiak, the extreme readings being: Dutch Harbor, 29.62; Kodiak, 28.62. Several cyclonic storms of Asiatic source moved into the Aleutian LOW during the last two decades.

If we consider the three island stations of Dutch Harbor, Midway Island, and Honolulu as indicative of the pressure alignment up and down the central North Pacific Ocean, it is found that fairly normal conditions for the month prevailed, except perhaps at Dutch Harbor, where the average p. m. pressure (29 days) was 29.46, or 0.13 inch below the normal. Here, however, the pressure is likely to be very eccentric, especially during the colder months. After the 10th the readings were almost continuously low. There was a wide barometric range, the highest reading being 30.62, on the 4th; the lowest, 28.14, on the 26th. At Midway Island subnormal pressures occurred except on nine days during the latter half of the month. The p. m. mean was 30.06, or 0.05 inch below normal. The highest reading was 30.40, on the 19th; the lowest, 29.90, on the 3d and 9th. The daily departures at Honolulu were not great, and the average pressure, 30.05, was only 0.03 above the normal, while the extremes were 30.16, on the 20th, and 29.90, on the 10th.

The adjoined table of gales and storms indicates pretty thoroughly the wind and pressure conditions accompanying the LOW formations of November. Gales of forces 9 and 10 were common to both east and west longitudes, in the latter especially north of the 40th parallel. There seems to have been a zone of quiet up and down the ocean between 160° and 170° W., since no gales were reported from it. Between 175° W. and 165° E. and 45° and 50° N. steamships encountered the most frequent gales—on at least 50 per cent of the days. But the severest storm winds of the month were the product of cyclones leaving northern Japan during the early half. On the 3d the British steamships *Empress of Asia* and *Harold Dollar* experienced storm to hurricane winds near 41° N., 153° E. The *Harold Dollar*, while the southeast hurricane was in progress, reported the lowest pressure of the month—27.84 inches. As the vessel's barometer went out of commission shortly after this reading was made, there may be some doubt as to its accuracy. On the 11th severe weather occurred west of that of the 3d, at which time the American steamship *West Jessup* reported a westerly gale of force 11, pressure 28.60, southeast of Hokkaido.

Waterspouts.—The American steamship *President Garfield* reported the following:

> Nov. 3. 4 p. m. Lat. 25° 55′ N., long. 166° 58′ W. Wind SW., force 4, sea rough, temperature of the air 74°, cloudiness 7 (St. Cu.), barometer 29.76.
>
> Observed five waterspouts within an area of 4 miles. Four of them were low, the tops ending in a mushroom which could be seen very plainly; but one reached to the clouds, also ending in a mushroom top, the whole of which was darker than the surrounding clouds. They lasted for about 30 minutes, moving eastward and rotating in a clockwise direction. The four low ones dropped. The high one had a very decided curve in it a little above the center, the upper part ascending and the lower part dropping. At the end it seemed to fade away.

The United States Army transport *Thomas* observed a small waterspout on the 29th in 34° 15′ N., 148° 50′ E.

TWO TYPHOONS IN THE PHILIPPINES DURING NOVEMBER, 1924

By REV. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

The first of these typhoons seems to have formed on the 20th to 21st over the Pacific to the north of Yap, near 139° longitude E. and 13° latitude N. The U. S. S. *Chaumont* experienced very bad weather with strong winds and even gales from the south quadrants on her way from Guam to the Philippines. According to observations made on board of this steamer the typhoon, after moving west for more than one day, took a northerly

direction on the night of the 22d and morning of the 23d while decreasing its rate of progress. Then in the afternoon of the 23d and on the 24th it remained almost stationary near 130° longitude E. and 16° latitude N. On the 25th it began to move westward and so rapidly that from 2 p. m. of the 25th to 6 a. m. of the 26th its rate of progress was about 26 miles per hour, a very extraordinary velocity for our latitude. This was the more remarkable because while crossing Luzon with such a velocity it was only a shallow depression of no great importance.

The center of the depression passed about 80 or 90 miles to the north of Manila in the early morning of the 26th moving west. Once in the China Sea it increased again in intensity and took a southwesterly direction, until it probably filled up on the 29th not far from 110° longitude E. and 8° latitude N.

The second typhoon of the month was shown for the first time by our weather maps at 6 a. m. of the 28th near 132° or 133° longitude E. and 10° latitude N. It moved west by north and traversed the Visayan Islands on the 29th through southern Samar, northern Leyte and northern Panay. After passing between Mindoro and Cuyo in the early morning of the 30th it inclined somewhat to the north, and at the time we are writing these notes (December 2), the center is still over the China Sea, about 300 miles to the west of Luzon and to the east-southeast of the Paracels, moving very slowly and possibly with a tendency to incline still more to the north.

We may add that at the end of the preceding month of October a typhoon was noticed moving northward about 150 or 200 miles to the east of Luzon, and that it recurved northeastward on the 31st of October to the east of Balintang and Bashi Channels. The position of the center at 6 a. m. of October 31 to November 2 was as follows:

October 31, 6 a. m., 20° 50′ latitude N., 125° 45′ longitude E.
November 1, 6 a. m., 25° 50′ latitude N., 131° 10′ longitude E.
November 2, 6 a. m., 35° latitude N., 145° longitude E.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

By ALFRED J. HENRY

The outstanding feature of the month was the establishment on the 13th of anticlyconic conditions over the Great Basin and the continuance of these conditions with but little change until the close of the month.

Another way of expressing this fact is to say that on the 13th a pronounced flow of cold polar air descended from the Canadian Northwest upon the northern Rockies and the Great Basin. This mass of cold air must have extended upward to a considerable altitude, since instead of skirting the eastern slope of the mountains it overrode them and settled over the Great Basin as before stated. From that region as a pivoted point detached masses of cold air moved southeastward on various subsequent dates overflowing the Gulf States and the lower Mississippi Valley, thus preventing the development in or the movement of cyclonic systems through that region.

This pressure distribution—high centered over the Great Basin with high though diminishing pressure thence southeastward—was effective in preventing precipitation in southern and central California and particularly in the Gulf States and lower Mississippi Valley.

The month as a whole must be classed as fairly warm and dry. The usual details follow.

CYCLONES AND ANTICYCLONES

By W. P. DAY

There was a marked increase of weather activity during November as compared with October, at least over the United States. This is shown in part by the charting of 19 well-developed LOWS against 14 during the preceding month and 15 HIGHS compared with 11. There were no HIGHS of the Hudson Bay type, which with others were effective during October in holding up and deflecting the normal movement of LOWS. The plateau HIGH was well developed during the latter half of the month and the LOWS made a corresponding shift from the North Pacific to the Alberta type or to developments east of the Rockies

FREE-AIR SUMMARY

By V. E. JAKL

In the upper-air averages for the month there were no important departures in any of the weather elements, except that all stations showed a decidedly stronger wind movement than usual throughout the vertical extent of the observations. (See Tables 1 and 2.) Temperature departures for all altitudes observed over the region represented by kite observations were substantially the same as those for the surface (see Chart III), the departures being as a rule quite uniform with altitude and generally positive and of small value. At Due West and Royal Center the temperature at all levels was normal to slightly below normal, as distinguished from the higher than normal temperature at all the other stations. The tables of average relative humidity and vapor pressure for the different stations show no important features, except as they indicate a general slightly drier condition aloft than is normal for the month.

Winds were practically normal in direction for all levels, the upper air resultants for the month determined from kite and pilot balloon observations over the middle and eastern portions of the country showing a general westerly drift. Above 1,000 meters there was a slight but general and definite northerly component to the winds over most stations, while in the levels embraced by the first thousand meters above sea level an average movement from about southwest was prevalent. This general westerly tendency of the winds probably extended to the Pacific coast, as pilot balloon observations at San Francisco gave resultant winds from approximately northwest to a considerable altitude.

Except over Key West and San Juan, winds aloft having an easterly component were almost entirely absent, one or two observations each of easterly winds at high altitudes being reported from Groesbeck, Memphis, and San Francisco. Over Key West and San Juan, the resultants of pilot-balloon observations showed deep northeasterly and southeasterly winds respectively.

The principal characteristic of the wind records is the frequency with which strong upper-air winds occurred,